

## CLAIMS

What is claimed is:

1. A method for selecting egresses of a multi-ISP local  
5 area network, for controlling a plurality of ISP egresses in  
a routing switch, which comprises an egress user board for  
processing of the ISP egresses, comprising the steps of:

providing a distributed NAT board for NAT in the routing  
switch;

10 presetting a NAT address pool corresponding to each of  
the ISP egresses for NAT;

querying in a routing table upon request of an outgoing  
packet from the local area network, and determining a next hop  
of the route for the packet; and

15 determining whether it is necessary to perform NAT at the  
ISP egress corresponding to the next hop of the route; and if  
yes, selecting one of the NAT address pools corresponding to  
the ISP egress, performing corresponding NAT by the NAT board,  
and forwarding the packet to the egress user board  
20 corresponding to the ISP; otherwise, forwarding the packet to  
the egress user board corresponding to the ISP.

2. The method for selecting egresses of a multi-ISP local  
area network according to claim 1, wherein the step of  
25 presetting a NAT address pool corresponding to each of the ISP  
egresses comprises the steps of:

binding each of outgoing interfaces connected with the  
ISP with a corresponding one of the NAT address pools; and  
creating a NAT policy tree in accordance with combination

of the outgoing interface and the source IP address as a keyword upon request for access, wherein leaf nodes of the NAT policy tree store binding relation between each of the outgoing interfaces connected with the ISP and the corresponding NAT address pool and the NAT policy information of the slot number of the distributed NAT board.

3. The method for selecting egresses of a multi-ISP local area network according to claim 2, wherein the step of determining whether it is necessary to perform NAT comprises the steps of:

detecting whether there is a public network flag in the routing table item hit by the subscriber traffic;

if yes, determining whether one of the leaf nodes of the NAT policy tree is hit in accordance with the combination of the outgoing interface and the source IP address as a keyword; and

if one of the leaf nodes of the NAT policy tree is hit, determining it is necessary to perform NAT; otherwise, determining it is unnecessary to perform NAT.

4. The method for selecting egresses of a multi-ISP local area network according to claim 2, wherein the step of selecting one of the NAT address pools corresponding to the ISP egress comprises the steps of:

performing matching in the leaf nodes of the policy tree in accordance with the combination of the outgoing interface and the source IP address as a keyword; and

obtaining the address pool and the slot number of the NAT

board from the matched leaf node of the policy tree.

5        5. The method for selecting egresses of a multi-ISP local area network according to claim 2, wherein the created NAT policy tree is a binary tree.

6. The method for selecting egresses of a multi-ISP local area network according to any one of claims 1 to 5, further comprising the steps of:

10        classifying the routes of the local area network into a general route and a policy route, and setting a routing policy for the policy route, wherein the general route is a standby for the policy route;

15        the step of querying in a routing table upon request of an outgoing packet from the local area network and determining a next hop of the route for the packet comprising the steps of:

      determining the policy route and/or the general route corresponding to the next hop;

20        determining whether the ISP egress corresponding to the policy route is available; and if available, replacing the destination address route with the policy routing result; otherwise, utilizing the destination address route of the primary general route.

25        7. The method for selecting egresses of a multi-ISP local area network according to claim 6, wherein the step of determining whether the policy route is available comprises the steps of:

querying in the routing table in accordance with the next hop of the policy route; and

determining whether the next hop can hit the 32-bit mask route corresponding to a directly-connected host; and if yes,  
5 determining the policy route is available, otherwise, determining the policy route is unavailable.

8. The method for selecting egresses of a multi-ISP local area network according to claim 6, wherein the step of  
10 determining a next hop of the route for the packet comprises the step of:

determining whether the route corresponds to a plurality of next hops; and if yes, performing traffic sharing by the plurality of corresponding ISPs.

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9. The method for selecting egresses of a multi-ISP local area network according to claim 6, wherein the routing switch comprises a routing module and a NAT module completely separated from each other, wherein

20 the routing module determines route egress for the subscriber traffic; and

the NAT module determines whether to perform NAT and which NAT address pool to be selected.